

Return on Investment for Remote Patient Monitoring – Call for Participants in a California HealthCare Foundation National Study

September 12, 2013



CENTER FOR
CONNECTED HEALTH



Center for
Technology and Aging



CALIFORNIA HEALTHCARE FOUNDATION
SUPPORTING IDEAS & INNOVATIONS TO IMPROVE HEALTH CARE FOR ALL CALIFORNIANS

Webinar Logistics

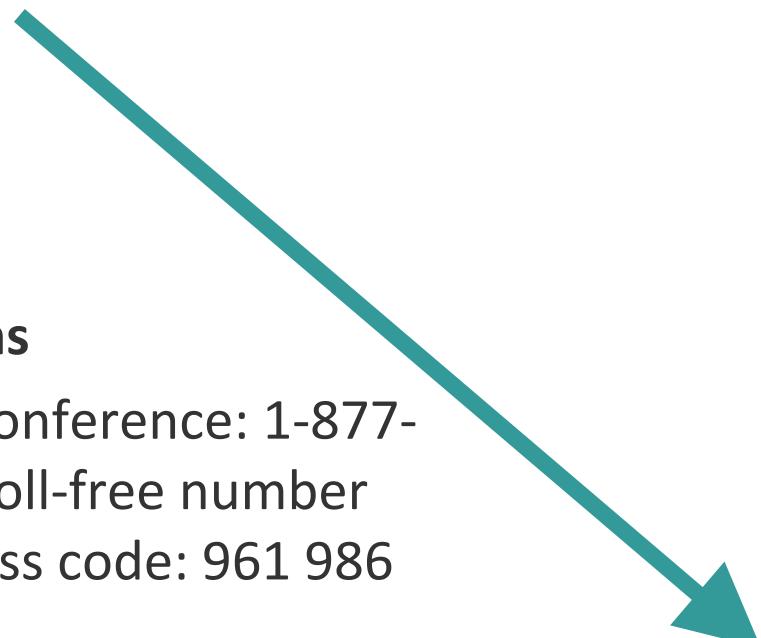
Welcome and thank you for joining CTA's ROI for RPM Webinar

- If you have technical difficulties call **1-866-229-3239** for assistance
- The **Audio** for this event will stream through your computer. **You can also dial-in to the conference line** to hear the audio and verbally ask questions. 1-877-668-4490 (Call-in toll-free number (US/Canada)) Access code: 961 986 094#
- If you are having audio difficulties, please send a chat message to Valerie Steinmetz or email at vsteinmetz@techandaging.org
- The Recording and Slides will be available at
www.techandaging.org

Questions – Two ways to ask questions

Ask Questions via the Q&A Box

- Please submit questions via the **Q&A Feature**.
- Please send your questions to **All Panelists**



The screenshot shows a software interface for a video conference. At the top, there's a navigation bar with 'Participants', 'Q&A', 'Chat', and other icons. Below it, a list shows 'Participants: 2'. Under 'Panelists: 1', 'Star Tiffany (Host)' is listed. Under 'Attendees: 1 (1 displayed)', 'Attendee View (me)' is shown. A toolbar below has icons for microphone, camera, and other controls. A blue bar labeled 'Q&A' is highlighted with a pink oval. At the bottom, a text input field says 'Ask: All Panelists' with a purple oval around it, and instructions: 'Select a participant in the ask menu first and type your question here. There is a 256 character limit.' A 'Send' button is also visible.

Verbally ask Questions

- Dial in to the teleconference: 1-877-668-4490 (Call-in toll-free number (US/Canada)) Access code: 961 986 094#

Presenters

David Lindeman, PhD

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Project Background

- Joint initiative of Center for Connected Health and Center for Technology and Aging
- Web-based, flexible ROI tool created for self-administration by health care organizations. www.telemedroi.com
- ROI model first tested with five organizations, who had very different implementation models
- Goals for the Webinar:
 - Introduce the web-based ROI Tool and National ROI Study
 - Demonstrate the ROI tool with RPM Program Data
 - Highlight Key Drivers for Positive ROI and Optimizing RPM Programs
 - Answer Questions on Tool Use and How to Participate in the Study



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Participate in a National ROI Study: Beta Testing the ROI Tool

CCH and CTA are conducting the first large-scale, national in-depth analysis of multiple health care providers to determine the ROI of RPM interventions.

Beta Tester Characteristics:

- Established RPM program that has been in operation for over 6 months.
- A minimum of 50 active CHF or COPD patients in RPM Program.
- Health Care organizations within the US.

While there is flexibility in program characteristics, our experience with providers indicates that we will obtain the most robust findings with these types of programs

Participate in a National ROI Study: Beta Testing the ROI Tool

Participating in this initiative will provide your organization with:

- Practical data on the ROI of your RPM program.
- Site-specific analysis and support from CTA and CCH staff including:
 - confirming appropriate inputs,
 - interpreting outcomes,
 - supporting scenario planning for optimal program design and operation.
- An opportunity to serve as a case study and potentially be highlighted in a peer-reviewed article or whitepaper

Data from participating organizations will be confidential

Participate in a National ROI Study: Beta Testing the ROI Tool

Beta testers will:

- Follow the steps in the web-based tool to analyze data from an existing RPM program within their organization (or a client's organization),
 - Create an account to be able to save, print and share your results.
- Access and use the web-based ROI Tool independently,
 - Please look through the user guide (<http://www.telemedroi.com/ROI-Manual.pdf>) for information on the data needed for the tool, detailed descriptions and definitions, and how to navigate the web-based tool.
- Review findings with senior management to validate the usability of the tool for program and financial decision making.

Analysis should take 1-2 weeks to complete

7 Steps of the ROI Tool

- **Step 1:** Patient enrollment and growth assumptions
- **Step 2:** Technology costs – including up-front investments required, per patient costs, and assumptions relating to type of technology needed
- **Step 3:** Staffing requirements – both fixed and variable
- **Step 4:** Other operational costs – including inventory management, refurbishment, other administrative costs
- **Step 5:** Outcomes - Value of the program measured by change in healthcare utilization – (Inpatient admissions, otpt visits, home visits)
- **Step 6:** ROI, Cost and Saving Summaries
- **Step 7:** Sensitivity Analysis

Data collection to occur prior to using the tool

Case Study: Centura Health at Home

- Centura Health at Home's RPM program combines a call center with a traditional RN led remote monitoring program targeting primarily patients with Diabetes, COPD and CHF
- Patients are enrolled for an average of 1.5 months, during which time they receive 2-3 nursing home visits, and calls from the nursing staff as needed when responses to daily questions and vital signs are out of the appropriate range
- Program is managed by existing in-house teams
- CCH received data on 87 patients showing pre and post program hospitalizations and nursing visits

Do-it-Yourself ROI Tool: Introduction

The screenshot shows the 'Introduction' page of the ROI Calculator. At the top, there's a navigation bar with 'ROI CALCULATOR' on the left, 'Download User Manual PDF' and 'Sign In' buttons, and a 'SAVE' button on the right. Below the navigation bar is a teal arrow pointing from the 'Download User Manual PDF' button down to the 'Start by answering a few questions' section. The main content area has a sidebar on the left with links like 'Introduction', 'Step 1 - Patient Enrollment', etc., and the main content area contains sections for 'Introduction', 'Step 1 - Patient Enrollment', 'Step 2 - Technology', 'Step 3 - Staffing', 'Step 4 - Other', 'Step 5 - Outcomes', 'Cost Summary', 'Savings Summary', 'ROI', and 'Sensitivity Analysis'. The 'Introduction' section contains text about RPM technologies and their benefits. The 'Step 1 - Patient Enrollment' section is highlighted with a green button.

Introduction

Efforts to reduce costs in healthcare have increased the adoption of remote patient monitoring (RPM) technologies. Devices including blood pressure monitors, glucose meters, and peripherals such as real-time face-to-face interactions between providers and patients, allow patients to monitor their vital signs at home. Clinical and behavioral data is collected and transmitted to clinicians. Studies indicate that use of RPM for serious chronic health conditions, such as congestive heart failure (CHF), is associated with improved symptom recognition and control as well as decreased use of acute care services. As CHF is prevalent and costly, more organizations are looking to RPM as an alternative form of chronic disease management.

Start by answering a few questions

Step 1 - Patient Enrollment

Step 1 - Patient Enrollment

Step 2 - Technology

Step 3 - Staffing

Step 4 - Other

Step 5 - Outcomes

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Introduction

The Center for Technology and Aging (CTA) and the Partners HealthCare Center for Connected Health (CCH) developed a return on investment (ROI) evaluation tool to help health care organizations assess the financial costs and benefits of RPM technologies.

ROI Evaluation

The ROI evaluation quantifies the value of a quality improvement program to an organization and its patients based on savings, improved outcomes, and improved care efficiency. It is a forward-looking tool that is meant to assist RPM leaders in the planning, implementation and evaluation of an RPM intervention. The ROI evaluation includes the following cost categories: patient enrollment, technology and operating costs, personnel or staffing costs, and other potential costs.

Get Started

You will need to have data regarding patient enrollment, technology and operating costs, personnel or staffing costs, and other potential costs before starting this evaluation. To complete the ROI analysis, navigate through the following elements in a step-by-step fashion: patient enrollment, program costs and outcomes. Help buttons (?) are provided within the calculator to assist you through the process.

- Register to save, print, and share data.
- Download the user manual
- Collect Program Data to input before using the tool

www.telemedroi.com

Step 1: Patient Enrollment

ROI CALCULATOR

Download User Manual PDF | Sign In | SAVE

Step 1 - Patient Enrollment

Specify the size of your patient enrollment in year 1 and projected enrollment at year 5. Benchmark data suggest a typical mid-size hospital sees 500 congestive heart failure (CHF) hospitalizations per year while a small integrated healthcare network (IDN) provider sees 2,500 CHF hospitalizations per year. Five elements should be considered in determining initial enrollment and enrollment over a five-year period: prevalence of CHF, patient eligibility criteria, clinical criteria, patient refusal rate, and effort required to scale the program at your organization. Some organizations have seen patient refusal rates between 10 to 40%. *Kulshreshtha, A., Kvedar, J.C., Goyal, A., Halpern, E.F., & Watson, A.J. (2010). Use of remote monitoring to improve outcomes in patients with heart failure: A pilot trial. International Journal of Telemedicine and Applications, 2010, 1–7.*

Enter the following:

Initial Enrollment ? 1650 5 Year Enrollment Goal ? 7500

Intervention Months (2–12) ? 1.5 **CALCULATE**

Enrollment Summary	Year 1	Year 2	Year 3	Year 4	Year 5
Total Patient Enrollment	1650	3113	4575	6038	7500
Concurrent Patient Enrollment	206	389	572	755	938

< Back | **Step 2 - Technology** >

- Initial Enrollment: 1650, Year 5: 7500
- Intervention Months: 1.5 (average length of time the patient uses the device. This typically ranges from 2-6 months)

Step 2: Technology

Introduction

Step 1 - Patient Enrollment

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Step 2 - Technology

Estimate investments in health information technology, both one-time and recurring, required to develop and administer the RPM intervention.

Enter all applicable information:

One-time Technology Costs: [?](#)

Type: ?	Cost: ?	Amortize: ?	Timeframe: ?
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

+ADD

Recurring Technology Costs: [?](#)

Type: ?	Cost: ?	Classification: ?	Patients on Cellular: ?
Hardware (Rent)	\$ 92	Mont...	%
Data Cost - Cellular	\$ 15	Mont...	50 %
Server Hosting	\$ 10	Mont...	% X
Misc. Tech Fees	\$ 2500	Annual	% X

+ADD

CLEAR DATA

▪ Recurring Technology Costs

- Hardware rental: \$92 a month
- Cellular data/month/unit: \$15
 - % patients on cellular = 50%
- Server Hosting/month/unit: \$10
- Misc Tech Fees (Vendor Fees): \$2,500/year

Step 3: Staffing

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Step 3 - Staffing

On this screen, enter staffing requirements to run your RPM program. This may include fixed management costs as well as variable staffing costs that will change with the number of patients enrolled. Consider how your staffing requirements may be different than what it is now, especially at an early stage of research compared to an operational stage of service.

Enter all applicable information:

Fixed Staffing: [?](#)

Position Type:	Position Title:	Percent Effort:	Salary:
Managem...	Telehealth Director	10...	\$ 120000
Managem...	Telehealth Manager	10...	\$ 100000
Support S...	Admin Coordinator	25%	\$ 72000

+ ADD

Variable Staffing: [?](#)

Position Type:	Position Title:	Salary:	Patient Load/FTE:
Clinical	Monitoring RN	\$ 89500	100
Support	Tech Support	\$ 52000	110

+ ADD

CLEAR DATA

[Back](#) [Step 4 - Other >](#)

▪ Fixed Staffing

- Telehealth Director
- Telehealth Manager
- Admin Coordinator

▪ Variable Staffing

- Monitoring RN
- Tech Support

- **Patient Load/FTE** = the amount of patients variable staffing will be able to care for at any given point in time.

Step 4: Other Costs

The screenshot shows the ROI CALCULATOR interface. At the top, there are navigation links: 'Temporary Scen...', 'Temporary Scen...', 'HCP', 'Centura' (with a dropdown arrow), a '+' button, and a 'SAVE' button. The main title 'Step 4 - Other' is displayed. A descriptive text box states: 'Every RPM program is slightly different. Here is an area for you to enter other costs that your organization may incur for implementing your RPM intervention.' Below this, a section titled 'Enter all applicable information:' contains three rows of input fields for 'Types', 'Cost', and 'Frequency Billed'. Each row has a dropdown menu for 'Types', a '\$' sign followed by a text input field for 'Cost', and a dropdown menu for 'Frequency Billed'. A '+ ADD' button is located below the first row, and a 'CLEAR DATA' button is below the second row. Navigation buttons at the bottom include '< Back' and 'Step 5 - Outcomes >'.

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Download User Manual PDF

CFlanagan2@partners.org

Temporary Scen...

Temporary Scen...

HCP

Centura

+

SAVE

Step 4 - Other

Every RPM program is slightly different. Here is an area for you to enter other costs that your organization may incur for implementing your RPM intervention.

Enter all applicable information:

Types:	Cost:	Frequency Billed:
<input type="text"/>	\$ <input type="text"/>	<input type="text"/>
<input type="text"/>	\$ <input type="text"/>	<input type="text"/>
<input type="text"/>	\$ <input type="text"/>	<input type="text"/>

+ ADD

CLEAR DATA

< Back

Step 5 - Outcomes >

- No other costs to include

Step 5: Outcomes

ROI CALCULATOR

[Temporary Scen...](#)[Temporary Scen...](#)[HCP](#)[Centura](#)[SAVE](#)

Step 5 - Outcomes

This step will help you estimate the savings from your program. In this tool, savings are estimated through change in utilization. Choose from in-patient, out-patient and home care utilization. The tool also allows you to enter 30-day utilization separately.

After entering utilization as a per-patient number or aggregate program number, please choose the appropriate risk holder, who may bear the financial risks/gains for that utilization metric. For example, your hospital may be responsible for 30-day re-admissions, while a home care agency may be at risk for home care visits.

Please hover over the (?) to see recommended default numbers, if you don't have program data yet.

Enter all applicable information:

Change In: ?	Type: ?	Amt. Change: ?	Avg. Cost: ?	Risk Holder: ?
All Inpatient Hos...	% Ch...	8.57	\$ 10495	Hos...
Nursing Visits	# Ev...	1	\$ 861	Ho...
All Outpatient V...			\$ 300	
Nursing Visits			\$ 330	

[+ADD](#)

Total Return / Patient

\$1760

[CALCULATE](#)[CLEAR DATA](#)[« Back](#)[Cost Summary >](#)

Inpatient Hospitalizations

- % change: $16.62 - 8.05 = 8.57\%$
- Year data:

Outcomes

Sample Size: 87

PRE	POST
Hospitalizations: 14.46	7
Outpatient Visits:	
Hospitalization Rate: 16.62%	8.05%
Inpatient Admissions Cost/Patient: \$1,745	\$845
Outpatient Visits Cost/Patient:	
Home Care Visits Cost Averted/Patient: \$861	

Nursing Visits

- # events/patient

Risk Holder

- Inpatient hospitalizations = hospital
- Nursing visits = home care agency

Step 6: ROI, Cost, Savings Summaries

Cost Summary

Temporary Scen...

Temporary Scen...

HCP

Centura 



Cost Summary

To help you understand the costs associated with your RPM intervention, this page provides you a quick way to see the total cost by year and the total cost per patient per year. You can also view patient enrollment based on your proposal.

Total Cost Per Patient Per Year:

	Year 1	Year 2	Year 3	Year 4	Year 5
Technology & Operating Costs	\$274725	\$518315	\$761738	\$1mil	\$1mil
Technology & Operating Costs/Patient	\$167	\$167	\$167	\$167	\$167
Staffing Costs	\$519752	\$770046	\$1mil	\$1mil	\$2mil
Staffing Costs/Patient	\$315	\$247	\$223	\$210	\$203
Other Costs	\$0	\$0	\$0	\$0	\$0
Other Costs/Patient	\$0	\$0	\$0	\$0	\$0
Total Costs	\$794477	\$1mil	\$2mil	\$2mil	\$3mil
Total Costs/Patient	\$482	\$414	\$390	\$377	\$369

Enrollment Summary

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Patient Enrollment	1650	3113	4575	6038	7500
Concurrent Patient Enrollment	206	389	572	755	938

[PRINT COST SUMMARY](#)

[EXPORT TO EXCEL](#)

[Savings Summary >](#)

Savings Summary

Temporary Scen...

Temporary Scen...

HCP

Centura 



ROI CALCULATOR

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Savings Summary

This step charts the potential cost savings to associated risk holders based on patient outcomes. A study found that patients using RPM to manage their CHF reduced overall healthcare costs by 41%, physician visits by 43%, emergency room visits by 33%, and hospitalizations by 29%.

Savings by Risk Holder



Provider Group

Payer

Home Care Agency

Other

\$0

Cost Savings

\$899

[PRINT GRAPH](#)

[< Back](#)

[ROI >](#)

Step 6: ROI, Cost, Savings Summaries

ROI CALCULATOR

Temporary Scen... Temporary Scen... HCP Centura + SAVE

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ROI

The ROI Evaluation compares the financial gains to financial costs and has been calculated as follows:

$$\text{ROI} = \frac{\text{Outcomes} - \text{Program Cost}}{\text{Program Cost}}$$

An ROI greater than 1 means that your RPM intervention will generate greater savings than costs. An ROI less than 0 means that your RPM intervention will not generate any positive returns. An ROI between 0 and 1 means that your RPM intervention will generate some savings; however, they will not be enough to cover the cost of the program.

Cost Categories	Year 1	Year 2	Year 3	Year 4	Year 5
Total Costs	\$794477	\$1mil	\$2mil	\$2mil	\$3mil
Total Returns	\$3mil	\$5mil	\$8mil	\$11mil	\$13mil

Return on Investment

Year	Return on Investment
Year 1	2.66
Year 2	3.25
Year 3	3.52
Year 4	3.67
Year 5	3.77

A line chart titled 'Return on Investment' showing the trend from Year 1 to Year 5. The Y-axis ranges from 0.21 to 6.21. The X-axis shows the years. The data points are: Year 1 (2.66), Year 2 (3.25), Year 3 (3.52), Year 4 (3.67), and Year 5 (3.77). The line shows a steady upward trend.

< Back Sensitivity Analysis >

Cost Categories

- Total Costs
- Total Returns
- Year 1 - 5

Step 7: Sensitivity Analysis

ROI CALCULATOR

Temporary Scen... Temporary Scen... HCP Centura + SAVE

Sensitivity Analysis

The sensitivity analysis component allows you to run simple scenarios to see how your ROI at year 5 would change under different estimates for patient enrollment and cost categories. The markers default to 0, and the amount column displays your inputs for year 5. To test out different scenarios, move the markers along the sliding scale and observe how this affects the ROI at year 5 displayed below. For example, if you'd like to see how your ROI would be affected if your technology costs increased, slide the technology costs/patient marker to the right, towards 100%. If you'd like to see how your ROI would be affected if your savings/patient were reduced, slide the savings/patient marker to the left, towards -100%. To find your 'break-even' point – which tells you how many patients your organization would have to enroll in order for your costs to equal your savings, move the first marker, which represents your 5-year goal for patient enrollment, until your ROI equals 1.00.

PATIENT ENROLLMENT	AMOUNT	SENSITIVITY
Patient Enrollment - 5 Year Goal	7500.00	<input max="100" min="-100" type="range" value="0"/>
COST CATEGORIES		
Technology Costs / Patient	\$167	<input max="100" min="-100" type="range" value="0"/>
Staffing Costs / Patient	\$203	<input max="100" min="-100" type="range" value="0"/>
Other Costs / Patient	\$0	<input max="100" min="-100" type="range" value="0"/>
Savings / Patient	\$1760	<input max="100" min="-100" type="range" value="0"/>
ROI at 5 years	3.76	

ROI Results from First Five Organizations

Organization	Year 1 ROI	Year 5 ROI	Highlights
Centura Health at Home	2.6	3.9	Chronic disease pts; 49% of returns due to RN visit reduction; 1.5 month intervention
Dignity Health	0.4	5.2	Year 1 returns/pt = \$9882
HealthCare Partners	1.3	18.9	COPD patients; IVR, opt out patient enrollment
Sharp HealthCare	1.6	1.7	Underinsured CHF pts
VA Central California	0.1	0.2	Randomized trial; 12 month intervention

Unless stated otherwise:1) savings attributable to reduced hospital admits; 2) pre-post comparison design; 3) primarily CHF patients

Key Considerations When Using the ROI Tool

- You will need to have access to your health care system's clinical and financial data.
- Intervention definition: The length of time patients are using the remote patient monitoring device.
 - For example, program duration per individual client may range from 1.5 months to 6 months to a full year.
- To save, print and share your results, please create an account.
- Equipment Cost: Users have the option to input one fixed, up front cost for the first year technology costs of the program or can amortize (spread) it over a set amount of years. Users can also include technology costs as a rental fee.
- Benchmark Data: The benchmark data are derived from validated studies and national benchmarks.
- Do not use commas when entering numbers. For example, salary would be 36400 as opposed to 36,400.

Key Drivers of a Positive ROI

- Characteristics of Programs with Positive ROI
 - Patient enrollment and growth assumptions
 - ✓ Programs need a minimum number of patients to measure ROI (50)
 - Staffing requirements
 - ✓ Focus on workflow efficiencies to improve nurse-to-patient ratio (patient load)
 - ✓ Consider RN or CHW staffing model
 - Technology costs
 - ✓ Renting allows less up front cost and the potential for a higher ROI in the first few years.
 - ✓ Account for growth of cellular use by older adults; factor in when selecting a technology
 - ✓ Select RPM technologies that monitor by exception
 - Other operational costs – including inventory management, refurbishment, other administrative costs
 - ✓ Streamline process for inventory management and refurbishment
 - Value of the program measured by change in healthcare utilization (inpatient admissions, outpatient visits, home visits)

Key Drivers of a Successful RPM Program

Characteristics of Successful RPM Programs:

- Organizational leadership – Champion
- Organizational familiarity with change management
- Staff engagement and buy-in
- Patient selection and engagement
- Work flow processes
- Technology deployment strategy
- Communication and staff/patient training
- Plan for Scaling and Sustainability

Interested in Participating in the National ROI Study?

Questions?

Email us to participate in the national ROI Study at: support@techandaging.org

ROI TOOL URL: www.telemedroi.com

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